Complete Summary

GUIDELINE TITLE

Practice guideline for evaluation of fever and infection in long-term care facilities.

BIBLIOGRAPHIC SOURCE(S)

Bentley DW, Bradley S, High K, Schoenbaum S, Taler G, Yoshikawa TT. Practice guidelines for evaluation of fever and infection in long-term care facilities. Clin Infect Dis 2000 Sep;31(3):640-53. [108 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Infection, with or without fever

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Geriatrics
Infectious Diseases
Internal Medicine
Nursing

INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers

Nurses
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To provide a rational approach to the evaluation of a potentially infected resident of a long-term care facility, while acknowledging the limitations in resources and staffing in skilled nursing facilities
- To help primary providers, consultants, and other health care personnel recognize infection, initiate appropriate treatment sooner, and improve outcomes, with associated reductions in inappropriate antibiotic use and cost of care

TARGET POPULATION

Residents of long-term care facilities with possible infection (with or without fever)

INTERVENTIONS AND PRACTICES CONSIDERED

1. Clinical evaluation (vital signs: temperature, blood pressure, heart rate, respiratory rate)
2. Laboratory tests
    - Complete blood cell count with differential
    - Blood culture
    - Urinalysis and urine culture
3. Pneumonia evaluation
    - Pulse oximetry
    - Chest radiographs
    - Respiratory secretions
4. Respiratory viral infection evaluation
5. Skin and soft tissue culture
6. Stool culture
7. Transfer of care to acute-care facility

MAJOR OUTCOMES CONSIDERED

Utility of clinical and laboratory evaluations to establish presence of infection.

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Grades reflecting the quality of evidence on which recommendations are based:

I. Evidence from at least one properly randomized, controlled trial
II. Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies (preferably from more than one center), from multiple time-series studies, or from dramatic results of uncontrolled experiments
III. Evidence from opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Strength of recommendation:

A. Good evidence to support a recommendation for use
B. Moderate evidence to support a recommendation for use
C. Poor evidence to support a recommendation
D. Moderate evidence to support a recommendation against use
E. Good evidence to support a recommendation against use

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guideline document was critically reviewed by the Practice Guidelines Committee and the Council of the Infectious Diseases Society of America. In addition, numerous infectious diseases specialists, geriatricians, and nurses reviewed this document and provided valuable and useful suggestions.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Excerpted by the National Guideline Clearinghouse (NGC)

Each recommendation includes a ranking for the strength and the quality of evidence supporting it. Definitions of the levels of evidence (I-III) and grades of recommendation (A-E) are repeated at the end of the Major Recommendations field.

Clinical Evaluation

Clinical evaluation of long-term care facility residents with suspected infection (i.e., clinical manifestations of infection or decline in functional status), should be a 3-tiered level of evaluation that includes nurse´s aides, the on-site nurse (charge nurse), and the responsible physician, advance-practice nurse, or physician assistant:

1. Nurse´s aides should measure vital signs: temperature, heart rate, blood pressure, and respiratory rate (B-II). Residents who are suspected of having an infection and have one temperature reading of >100Â°F (37.8Â°C), ≥2 readings of >99Â°F (37.2Â°C), or an increase of 2Â°F (1.1Â°C) over baseline should be reported immediately to the on-site nurse (B-II).
2. The initial clinical evaluation regarding possible sites of infection should be done by the on-site nurse, and information should be relayed to the responsible advance-practice nurse, physician assistant, or physician for decisions regarding further evaluation (B-III).
3. The full extent of the clinical evaluation should be documented as part of the medical record. If specific diagnostic measures are consciously withheld, the reasons should be recorded (B-III).

Laboratory Tests

As long as residents in long-term care facilities have no previous advance directives that limit aggressive medical intervention, initial diagnostic tests for suspected infection can be done in the long-term care facility, if hospitalization is not warranted and resources are available for specimen collection, laboratory tests, and radiological studies to be done in a timely manner (B-III).

Blood cell count. A complete blood cell count, including peripheral white blood cell and differential cell counts, should be performed for all long-term care facility residents who are suspected of having infection (B-II).

The presence of an elevated white blood cell (WBC) count ($\geq$14,000 cells/mm^3) or a left shift (percent band neutrophils or metamyelocytes >6% or total band neutrophil count $\geq$1500/mm^3) warrants a careful assessment for bacterial infection in any long-term care facility resident with suspected infection with or without fever (B-II).

In the absence of fever, leukocytosis and/or left shift, and specific clinical manifestations of a focal infection, the likelihood of a bacterial infection is low. Further diagnostic tests for such an infection may not be indicated because of the potential for a low yield (D-II). Nonbacterial infections, however, cannot be excluded.

Urinalysis and urine culture. The diagnostic laboratory evaluation of suspected urinary tract infections in noncatheterized residents should be reserved for those with acute onset of urinary tract infection-associated symptoms and signs (e.g., fever, dysuria, gross hematuria, new or worsening urinary incontinence, and/or suspected bacteremia). In residents with long-term indwelling urethral catheters, evaluation is indicated if there is suspected urosepsis (i.e., fever >100.3Â°F [38Â°C], shaking chills, hypotension, and delirium), especially in a setting of recent catheter obstruction or change (A-II).

Urinalysis and urine cultures should not be performed for asymptomatic residents (E-II).

Appropriately collected urine specimens include a midstream or clean-catch specimen from elderly men who are cooperative and functionally capable; however, it is often necessary to use a freshly applied, clean condom external collection system with frequent monitoring of the urine bag (B-II). Specimen collection from women will often require an in-and-out catheterization (B-III).

Residents with long-term indwelling urethral catheters should have urine obtained by aspiration of the catheter port and not from the drainage bag (B-II). Unless obstruction is suspected, it is not necessary to change the catheter to better assess bladder (or kidney) microbiology. (D-III).

The minimum laboratory evaluation for suspected urinary tract infection should include a urinalysis for leukocyte esterase by use of a dipstick and a microscopic examination for white blood cells (B-II). If no pyuria (<10 white blood cells per high-power field of spun urine and negative leukocyte esterase by dipstick) is demonstrated, no urine culture need be requested (E-II). If pyuria or a positive leukocyte esterase test is present, only then should the laboratory set up urine specimens for culture and antimicrobial susceptibility testing (B-III).

If urosepsis is suspected, urine and paired blood specimens should be obtained for culture and antimicrobial susceptibility testing, and a Gram's stain of uncentrifuged urine should be requested (B-III).

Blood culture. Blood cultures are not recommended for residents of long-term care facilities with suspected bacteremia because of low yield of positive cultures and high mortality rates among patients within 24 hours of presentation (D-III). For most residents (pending the resident's and family's approval), suspected bacteremia warrants transfer to an acute-care facility.

Pneumonia evaluation. If pneumonia is clinically suspected and resources are available, the following diagnostic studies should be performed:

1. Pulse oximetry should be performed for residents with respiratory rates of >25 breaths per minute to document hypoxemia (oxygen saturation <90%) as a further clue to the diagnosis of pneumonia and to serve as an important predictor of short-term (30 day) mortality and impending respiratory failure requiring transfer to an acute-care facility pending the resident's or family's wishes (B-II).
2. A chest radiograph should be performed if hypoxemia is documented or suspected to identify the presence of a new infiltrate compatible with acute pneumonia and to exclude other complicating conditions (e.g., multilobe infiltrates, large pleural effusions, congestive heart failure, mass lesions) (C-III).
3. Respiratory secretions (i.e., expectorated sputum or nasopharyngeal aspirate specimens) should be obtained at the onset of suspected pneumonia to assess for purulence. If a purulent sputum is obtained, it should be submitted for Gram's staining with cytologic screening for squamous epithelial cells and culture and sensitivity tests, provided resources are available for transportation of the specimen within1>2 hours of collection (C-III).
4. On receipt of sputum samples, the laboratory should be instructed to set up the specimen for culture and sensitivity testing only if the quality of the specimen is acceptable (i.e., the Gram's stain demonstrates <25 squamous epithelial cells per low power field) (A-I).

Respiratory viral infection evaluation. At the onset of a suspected respiratory viral infection outbreak, swab samples should be obtained from the throat and nasopharynx of several acutely ill residents. These swabs should be combined in a single tube containing refrigerated viral transport media for transport to an experienced laboratory for virus isolation and rapid diagnostic testing for influenza A and other common viruses (A-III).

Skin and soft tissue culture. Skin and soft tissue cultures should be performed under select conditions. Surface swab cultures are not indicated for cellulitis (E-III). Fine-needle aspirates for Gram's stain and culture may be appropriate in special circumstances in which unusual pathogens are suspected (e.g., gram-negative bacilli in diabetics), fluctuant areas suggest an abscess is present, or initial antimicrobial treatment has been unsuccessful (C-III). These circumstances, however, should warrant consideration for hospitalization, depending on the wishes of the resident or their family.

If a pressure ulcer demonstrates poor healing and/or persistent purulent drainage, obtain specimens for culture of purulent drainage or deep infected tissue at the time of surgical debridement or surgical biopsy (B-II). Do not obtain surface swab specimens for microbiology from pressure ulcers (E-III).

If scabies is suspected, an etiologic diagnosis should be attempted by light microscopic demonstration of mites, eggs, or mite feces on mineral oil preparation from several scrapings of typical scabies "burrows" (C-III). If proper diagnostic equipment is not available and clinical experience with scabies is limited, consider consultation with a dermatologist to inspect or obtain scrapings from suspected persons (C-III).

Stool culture. Laboratory evaluation of diarrhea will depend on meeting one of several clinical criteria. If the resident has a low-grade fever, new-onset diarrhea, and no clinical deterioration and there is no outbreak of diarrhea in the long-term care facility, no stool should be submitted for laboratory evaluation (D-III).

If the resident develops diarrhea and has received antibiotics within the previous 30 days, suspect Clostridium difficile-associated diarrhea, and submit a single diarrheal stool specimen to the laboratory for C. difficile toxin assay (A-II). If diarrhea persists and the assay is negative, submit one or two additional stool specimens for toxin assay (A-II).

If the resident exhibits severe fever, abdominal cramps, and/or bloody diarrhea or white blood cells in the stool and there is no history of antibiotics given within the previous 30 days, one should submit a stool culture for the isolation of the most frequent invasive enteropathogens (i.e., Campylobacter jejuni, Salmonella and Shigella species, and Escherichia coli O157:H7) (A-II). In most instances, however, because there is often associated bacteremia with these pathogens, prompt transfer to an acute-care facility is warranted for most residents (pending the resident's or family's approval) (A-II).

Transfer of Care to Acute-Care Facility

Upon admission to a long-term care facility, discussions outlining general parameters (including advance directive) for considering transfer to an acute-care facility should be a standard component of the evaluation and should be documented in the medical record (B-III).

Decisions regarding transfer of a long-term care facility resident to an acute-care facility should ultimately be at the discretion of the attending physician (according to an advance directive) or as informed by the resident or their family or caregiver (A-III).

In the absence of an advance directive or directions from the resident or their family or caregiver, the attending physician's decision regarding a transfer should be based on available institutional policies; clinical condition, underlying disease(s), and prognosis of the resident; efficacy and cost effectiveness of interventions and acute care; and/or capacity of the long-term care facility to provide necessary care and support to the resident (B-III).

When a transfer decision is made, the rationale for transfer to another facility for care should be documented in a progress note or in the discharge summary (B-III).

The facility should establish a process for ongoing review and analysis of cases in which the resident is transferred to an acute-care facility or to an emergency department, even when the resident returns to the long-term care facility without admission (B-III).

Performance Measures

The following performance measures were recommended by the members of the subcommittee as a minimum level of assessment to ensure quality care for the evaluation of infection and/or fever in residents of long-term care facilities. The performance measures were not assigned any target values or benchmark rates to determine compliance with the measure; it was determined that these targets should be established at each institution according to its own unique circumstances and available resources. The performance measures were developed by consensus and have not been documented to be efficacious or cost effective by clinical studies.

- There should be documentation by a licensed nurse (licensed practical nurse or registered nurse) of a change of clinical status of a long-term care facility resident.
- A licensed nurse should communicate directly to a physician, advance-practice nurse, or physician assistant any change in the clinical status of long-term care facility residents in a timely manner, as defined by the long-term care facility.
- Vital signs, including temperature, pulse, respiration rate, and blood pressure, should be measured and recorded in the medical record of long-term care facility residents suspected of an infection.
- There should be an appropriate assessment by a licensed health care provider (i.e., physician, advance-practice nurse, or physician assistant) of the clinical status of long-term care facility residents suspected of having an infection.
- When a transfer of a long-term care facility resident to an acute-care facility occurs, there should be documentation on the medical record of the reason(s) for the transfer.

Definitions of Strength of Recommendation and Quality of Evidence Ratings:

Quality of evidence:

I. Evidence from at least one properly randomized, controlled trial
II. Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies (preferably from more than one center), from multiple time-series studies, or from dramatic results of uncontrolled experiments
III. Evidence from opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees

Strength of recommendation:

A. Good evidence to support a recommendation for use
B. Moderate evidence to support a recommendation for use
C. Poor evidence to support a recommendation
D. Moderate evidence to support a recommendation against use
E. Good evidence to support a recommendation against use

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Infections remain one of the most common reasons for hospitalization and one of the most frequent causes of death in residents of long-term care facilities. It is hoped that this guideline will help primary providers, consultants, and other health care personnel recognize infection, initiate appropriate treatment sooner, and improve outcomes, with associated reductions in inappropriate antibiotic use and cost of care.

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The following performance measures were recommended by the members of the subcommittee as a minimum level of assessment to ensure quality care for the evaluation of infection and/or fever in residents of long-term care facilities. The performance measures were not assigned any target values or benchmark rates to determine compliance with the measure; it was determined that these targets should be established at each institution according to its own unique circumstances and available resources. The performance measures were developed by consensus and have not been documented to be efficacious or cost effective by clinical studies.

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- Vital signs, including temperature, pulse, respiration rate, and blood pressure, should be measured and recorded in the medical record of long-term care facility residents suspected of an infection.
- There should be an appropriate assessment by a licensed health care provider (i.e., physician, advance-practice nurse, or physician assistant) of the clinical status of long-term care facility residents suspected of having an infection.

- When a transfer of a long-term care facility resident to an acute-care facility occurs, there should be documentation on the medical record of the reason(s) for the transfer.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Bentley DW, Bradley S, High K, Schoenbaum S, Taler G, Yoshikawa TT. Practice guidelines for evaluation of fever and infection in long-term care facilities. Clin Infect Dis 2000 Sep;31(3):640-53. [108 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Sep

GUIDELINE DEVELOPER(S)

Infectious Diseases Society of America - Medical Specialty Society

SOURCE(S) OF FUNDING

Infectious Diseases Society of America (IDSA)

GUIDELINE COMMITTEE

Infectious Diseases Society of America (IDSA) Practice Guidelines Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Authors: David W. Bentley, Suzanne Bradley, Kevin High, Stephen Schoenbaum, George Taler, and Thomas T. Yoshikawa (Committee Chair)

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the Infectious Diseases Society of America (IDSA) Web site. Also available in HTML format.

Print copies: Available from the University of Chicago Press; fax: (773) 702-6096.

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Kish MA. Guide to development of practice guidelines. Clinical Infectious Diseases 2001;32:851-4.
- Gross PA. Practice guidelines for infectious diseases: Rationale for a work in progress. Clin Infect Dis. 1998 May;26(5):1037-41.
- Gross PA, Barrett TL, Dellinger EP, Krause PJ, Martone WJ, McGowan JE Jr, Sweet RL, Wenzel RP. Purpose of quality standards for infectious diseases. Infectious Diseases Society of America. Clin Infect Dis 1994 Mar;18(3):421.

Electronic copies: Available from the Infectious Diseases Society of American (IDSA) Web site.

Print copies: Available from Infectious Diseases Society of America, 66 Canal Center Plaza, Suite 600, Alexandria, VA 22314.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on May 1, 2001. The information was verified by the guideline developer as of June 29, 2001.

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